Equation 3 (v2.3): Unified Field Tensor - Conservative Phenomenological Form (ASCII-safe)

Purpose: Provide a mathematically well-posed, conservative form that removes tensor mismatches and undefined operators, while preserving the intent of a coherence-weighted coupling as a phenomenological extension. This document does not claim a confirmed new physical law; it defines a testable model form.

1. Core Field Equation (GR-consistent structure)

G_mu_nu + Lambda_eff * g_mu_nu = (8*pi*G/c^4) * (T_m_mu_nu + T_EM_mu_nu + kappa(S_C) * T_Psi_mu_nu)

2. Definitions

G_mu_nu: Einstein tensor (spacetime curvature).

g_mu_nu: metric tensor.

G: Newton constant. c: speed of light. pi: pi.

T_m_mu_nu: stress-energy tensor of ordinary matter and non-EM fields already included in the matter model.

T_EM_mu_nu: electromagnetic stress-energy tensor (NOT the EM field tensor F_mu_nu).

Psi: scalar field representing an additional background degree of freedom used as a phenomenological proxy for the coherence-field concept.

T_Psi_mu_nu: stress-energy tensor of the scalar field Psi, defined below.

S_C in [0,1]: coherence state scalar (dimensionless), e.g., derived from a Lumen Code coherence measure.

kappa(S_C): bounded, dimensionless coupling function mapping [0,1] to [0,1]. Example: kappa(S_C) = S_C^n with n >= 1.

Lambda_eff: effective cosmological-like term. Lambda_eff = Lambda_0 + lambda_1 * SC_global, where SC_global is a chosen global-average coherence metric.

3. Scalar-field stress-energy (standard form)

T_Psi_mu_nu = (d_mu Psi)*(d_nu Psi) - (1/2)*g_mu_nu * ((d_alpha Psi)*(d^alpha Psi) + 2*V(Psi))

d_mu denotes a covariant derivative. V(Psi) is a scalar potential (can be set to 0 for a minimal model).

4. Limiting behavior (internal consistency)

If S_C -> 0 then kappa(S_C) -> 0, so the model reduces to standard GR with matter + EM plus Lambda_eff.

If S_C -> 1 then kappa(S_C) -> 1 (or near 1), so the scalar-field contribution is maximally included.

5. Test protocol (conservative and falsifiable)

Goal: test whether a pre-registered coherence metric is associated with small residual changes in environmental time-series after standard corrections. This is a correlation-screening test, not a proof of mechanism.

Null hypothesis (H0)

After removing known drivers (tides, seismic activity, geomagnetic storms, temperature and pressure effects, instrument drift), residual gravimeter and magnetometer signals show no statistically significant association with S_C.

Procedure

1) Pre-register event windows and metrics, including S_C, stations used, filtering and correction pipeline, and statistical tests.

2) Collect data from multiple independent stations (gravimeter residuals and magnetometer noise metrics such as band-limited power).

3) Controls include matched sham windows, permutation tests, exclusion of major geomagnetic and seismic events, and inclusion of local environmental covariates.

4) Primary outputs include effect size, corrected p-values or Bayes factors, confidence intervals, and replication across stations.

Interpretation rule

A single positive result is treated as a candidate anomaly requiring replication. Consistent null results falsify the claim at the tested sensitivity.

Status

This v2.3 formulation avoids HTML-sensitive characters, enforces bounded coupling, and is robust under Archive.org text extraction. It is suitable for archiving.